# **Year of Tropical Convection (YOTC)**

Multi-scale Organization of Tropical Convection and its Interaction with the Global Circulation:

Time-scales up to Seasonal

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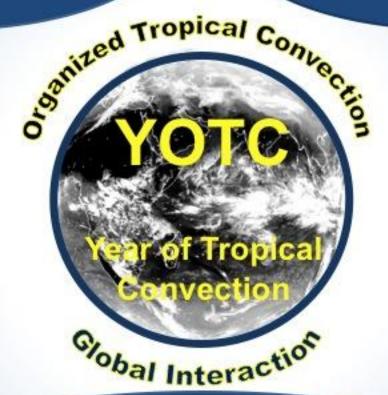
**Seamless Prediction Initiative** 

#### **Global Prediction**

High-resolution operational deterministic-model data sets

### **Integrated Observations**

Satellite, field-campaign, in-situ data sets



#### Research

Attribution studies of global data sets; parameterized, superparameterized, and explicit convection in regional-to-global models; theoretical studies

## Science Plan, Implementation Plan, meeting reports, etc: www.ucar.edu/yotc

- High-Resolution Analysis & Forecast Archives
  - ECMWF T799 ~25km, on-line
  - · NASA/GEOS-5 ~25km, in progress
  - · NCEP ~40km, in progress
- Integrated observations
  - Satellite datasets (operational and research)
  - Field-campaign IOPs and EOPs
  - Long-term in-situ measurements (DOE/ARM TWP)
  - Satellite data dissemination (NASA Goddard Giovanni)
- · Research
  - Attribution and experimentation: high-resolution prediction
  - Modeling: parameterized and explicit convection
  - Theoretical/simplified models

• "Year" (data archiving period): May 2008-Oct 2009 → April 2010

## Science elements

- MJO and convectively coupled equatorial waves
- Monsoons and intraseasonal variability
- Easterly waves and tropical cyclones
- -Tropical-extratropical interaction
- Diurnal cycle of precipitation

### YOTC Implementation Workshop (July 13-15 2009)

- Finalize YOTC Implementation Plan
- Select meteorological events during "Year"
- Establish collaborative research projects

## Collaboration

- ECMWF/GMAO/NCEP global prediction systems
- Global CRMs: NICAM, GEOS-5...
- Super-parameterization: CMMAP and NASA-Goddard MMFs
- NCAR Nested Tropical Channel Model
- NERC/UK MetOffice Cascade project
- Selected CLIVAR and GEWEX projects

## Research elements

#### **MJO-Monsoon Interseasonal Oscillation (MJO-MISMO)**

- Hind-cast experiments based on 2008 and 2009 MJO events: CLIVAR Asian-Australian Monsoon Panel (AAMP)
- Rapid northward progression of ITCZ in 2009 and its effects on Indian monsoon rainfall
- 2008-2009 heavy-rain events in monsoon region: Asian Monsoon Years (AMY)
- Forecasts/diagnostic/idealized simulation of boreal-winter MJOs in Indian Ocean/TWP: Cascade project
- MJO prediction (ECMWF)

### **Tropical-Extratropical interaction**

Experiments using T799 tropical analysis ("perfect tropics") relaxed to midlatitudes examining high-impact midlatitude weather (ECMWF)

### **Organized convection and African Easterly Waves**

July 7-22 '08; Aug-Sept 14 '08: AMMA researchers

#### Weather as an initial-value problem for climate (seamless prediction)

- Ensemble of 5-day forecasts ("transposed AMIP") CMIP5 study by Working Group on Numerical Experimentation (WGNE) regarding 2008 and 2009 YOTC cases.
- CCRP ARM Parameterization Testbed (US Dept. of Energy)
  -Community Atmospheric Model (SP-CAM) and Coupled Climate
  System Model (SP-CCSM) applied to transposed AMIP for same
  periods as WGNE experiments (CMMAP)

Nested simulation of the Tropics at 10 km grid-spacing for the entire YOTC period of May 2008-Oct 2009, possibly extended through April 2010 (i.e., 2 years), forced by ECMWF T799 meriodional boundary conditions with nested sub-domains placed over the Maritime Continent (4 km and 1.3 km)

### "Maritime Continent MJO-prediction barrier"

Effects of steep orography, precipitating convection, sea- and landbreezes on MJO lifecycles using the above dataset

## Meteorological events

- MJOs May-June 2008; Jan-Feb 2009; April 2009
- CCEWs May 2008, March-April 2009
- TPARC winter 24 Feb 2009
- MISMO summer 2009 monsoon
- AEW- TC: July 7-22 2008; Aug-Sept 14 2008, Kelvin waves June and July 2008

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## AGU Fall Meeting YOTC Session San Francisco, 14-18 December 2009

Session A38: Multi-scale Organization of Tropical Convection and its Interaction with the Large-scale Circulation: Year of Tropical Convection (YOTC)

**Conveners: Mitch Moncrieff & Duane Waliser** 

Submission deadline: Sept 3 at AGU website www.agu.org/meetings